

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket No: 02-205-0

In re patent application of

Patten, Phillip et al.

Serial No. 08/769,062

Filed: December 18, 1996

For: METHODS AND COMPOSITIONS FOR POLYPEPTIDE ENGINEERING

**COPY FROM PARENT**

STATEMENT TO SUPPORT FILING AND SUBMISSION IN  
ACCORDANCE WITH 37 C.F.R. §§ 1.821-1.825

Assistant Commissioner for Patents  
Washington, D.C. 20231  
**Box SEQUENCE**

Sir:

In connection with a Sequence Listing submitted concurrently herewith, the undersigned hereby states that:

1. the submission, filed herewith in accordance with 37 C.F.R. § 1.821(g), does not include new matter;


2. the content of the attached paper copy and the attached computer readable copy of the Sequence Listing, submitted in accordance with 37 C.F.R. § 1.821(c) and (e), respectively, are the same; and

3. all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United

095492.091001

<p>                     1. <i>Species</i>                      2. <i>Genus</i>                      3. <i>Family</i>                      4. <i>Order</i>                      5. <i>Class</i>                      6. <i>Phylum</i>                      7. <i>Kingdom</i>                      8. <i>Domain</i>                      9. <i>Life history</i>                      10. <i>Reproduction</i>                      11. <i>Growth</i>                      12. <i>Development</i>                      13. <i>Physiology</i>                      14. <i>Behavior</i>                      15. <i>Ecology</i>                      16. <i>Evolution</i>                      17. <i>Systematics</i>                      18. <i>Biogeography</i>                      19. <i>Conservation</i>                      20. <i>Management</i>                      21. <i>Policy</i>                      22. <i>Education</i>                      23. <i>Outreach</i>                      24. <i>Publications</i>                      25. <i>References</i>                      26. <i>Index</i>                      27. <i>Glossary</i>                      28. <i>Appendices</i>                      29. <i>Tables</i>                      30. <i>Figures</i>                      31. <i>Maps</i>                      32. <i>Photographs</i>                      33. <i>Video</i>                      34. <i>Audio</i>                      35. <i>Interactive</i>                      36. <i>Simulations</i>                      37. <i>Games</i>                      38. <i>Quizzes</i>                      39. <i>Exercises</i>                      40. <i>Projects</i>                      41. <i>Case studies</i>                      42. <i>Interviews</i>                      43. <i>Opinion pieces</i>                      44. <i>Editorials</i>                      45. <i>Letters to the editor</i>                      46. <i>Book reviews</i>                      47. <i>Press releases</i>                      48. <i>Press 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Date May 2, 1999

  
James A. Coburn

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# SEQUENCE LISTING

<110> Patten, Phillip  
Stemmer, Willem

<120> METHODS AND COMPOSITIONS FOR POLYPEPTIDE ENGINEERING

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<150> 08/198,431

<151> 1994-02-17

<150> 08/425,684

<151> 1995-04-18

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TC2160-2594550

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<210> 15

<211> 60

<212> DNA

<213> Artificial Sequence

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<210> 16

<211> 60 --

<212> DNA

<213> Artificial Sequence

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<400> 16

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<210> 17

<211> 60

<212> DNA

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<211> 60

<213> Artificial Sequence

<223> Description of Artificial Sequence: degenerate oligonucleotide used for codon usage library

aatacaacgt tcagcaggac cayacyaarg ayccdacyct gcaggaaatg accgaaqttg 60

<211> 60

<213> Artificial Sequence

<223> Description of Artificial Sequence: degenerate oligonucleotide used for codon usage library

aaccgcgctg gtttctacct gttygtdgar ggyggycgya tcgaccacgg tcaccacqac 60

<211> 60

<213> Artificial Sequence

<223> Description of Artificial Sequence: degenerate oligonucleotide used for codon usage library

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<211> 60

<212> DNA



<213> Artificial Sequence

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<223> Description of Artificial Sequence: degenerate  
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<211> 60

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<211> 60

<212> DNA

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<211> 60

<212> DNA

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<210> 28

<211> 60

<212> DNA

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oligonucleotide used for codon usage library

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<210> 30

<211> 62

<212> DNA

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<223> Description of Artificial Sequence: degenerate  
oligonucleotide used for codon usage library

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ttccgcctct agagaattct tartacagrg thghghccag gaggagcagc atagcaccag 60  
cc 62

<210> 31

<211> 58

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<210> 32

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<210> 33

<211> 60

<212> DNA

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gcgaaaacag caacgtcttc rccrcrtgr gtytcrghg cctgcggaac agcagcctgc 60

<210> 34

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T02T60-2554550

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<210> 35

<211> 60

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<210> 36

<211> 60

<212> DNA

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<210> 37

<211> 60

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<211> 60

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<210> 39

<211> 60

<212> DNA

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tacgaacacc gttaacagaa gcrtrtchg grtaytchggtgccgggggta ccaaccggga 60

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<223> Description of Artificial Sequence: degenerate oligonucleotide used for codon usage library

cccaggataa cgtcgatgtc catrttrtth accagytghg cagcgatgtc ctggcaaccg 60

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caggtcagcg tcagagtacc arttrcgrtt hacrgtrtga gcgtaagcac cagccggaga 60

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<210> 65  
 <211> 18  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate  
 oligonucleotide used for alpha interferon  
 shuffling

<400> 65  
 tctaggagss\_tctswtcc

18

<210> 66  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate  
 oligonucleotide used for alpha interferon  
 shuffling

<400> 66  
 gaacttdwcc agcaamtgaa t

21

<210> 67  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate  
 oligonucleotide used for alpha interferon  
 shuffling

<400> 67  
 attcakttgcc tggwhaagtt c

21

<210> 68  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate  
 oligonucleotide used for alpha interferon  
 shuffling

00054592 091201

19

```
<210> 69
<211> 19
<212> DNA
<213> Artificial Sequence
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<220>  
<223> Description of Artificial Sequence: degenerate  
oligonucleotide used for alpha interferon  
shuffling

19

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<210> 70
<211> 18
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling
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18

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<210> 71
<211> 18
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling
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18

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<210> 72
<211> 19
<212> DNA
<213> Artificial Sequence
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<220>  
<223> Description of Artificial Sequence: degenerate  
oligonucleotide used for alpha interferon  
shuffling

19

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<210> 73
<211> 19
<212> DNA
<213> Artificial Sequence
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<220>

<400> 73  
ctgctctgac aacctccca

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<210> 74
<211> 18
<212> DNA
<213> Artificial Sequence
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<220>  
<223> Description of Artificial Sequence: degenerate  
oligonucleotide used for alpha interferon  
shuffling

<400> 74  
tcawtccttm ctcytaa

18

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<210> 75
<211> 166
<212> PRT
<213> consensus alpha interferon
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<400> 75  
Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp  
20 25 30

Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
35 40 45

Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr  
50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Trp Glu Gln Ser  
65 70 75 80

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu  
85 90 95

Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met  
100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr  
115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
130 135 140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys  
145 150 155 160

Arg Leu Arg Arg Lys Asp  
165

<210> 76

<211> 166  
 <212> PRT  
 <213> human alpha interferon

<400> 76

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp  
 20 25 30

Arg His Asp Phe Gly Leu Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
 35 40 45

Gln Lys Thr Gln Ala Ile Pro Val Leu His Glu Met Ile Gln Gln Thr  
 50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser  
 65 70 75 80

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asn Leu  
 85 90 95

Glu Ala Cys Val Ile Gln Glu Val Gly Met Glu Glu Thr Pro Leu Met  
 100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr  
 115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
 130 135 140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys  
 145 150 155 160

Arg Leu Arg Arg Lys Asp  
 165

<210> 77  
 <211> 166  
 <212> PRT  
 <213> human alpha interferon

<400> 77

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp  
 20 25 30

Arg Pro Asp Phe Gly Leu Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
 35 40 45

Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr  
 50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser  
 65 70 75 80

099469-094

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asn Leu  
                   85                                  90                                  95  
 Glu Ala Cys Val Ile Gln Glu Val Gly Met Glu Glu Thr Pro Leu Met  
                   100                                  105                                  110  
 Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr  
                   115                                  120                                  125  
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
                   130                                  135                                  140  
 Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys  
                   145                                  150                                  155                                  160  
 Ile Leu Arg Arg Lys Asp  
                                   165

<210> 78  
 <211> 166  
 <212> PRT  
 <213> human alpha interferon

<400> 78  
 Cys Asn Leu Ser Gln Thr His Ser Leu Asn Asn Arg Arg Thr Leu Met  
   1                                  5                                  10                                  15  
 Leu Leu Ala Gln Met Arg Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp  
                   20                                  25                                  30  
 Arg His Asp Phe Glu Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
                   35                                  40                                  45  
 Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Met Gln Gln Thr  
                   50                                  55                                  60  
 Phe Asn Leu Phe Ser Thr Lys Asn Ser Ser Ala Ala Trp Asp Glu Thr  
                   65                                  70                                  75                                  80  
 Leu Leu Glu Lys Phe Tyr Ile Glu Leu Phe Gln Gln Met Asn Asp Leu  
                   85                                  90                                  95  
 Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met  
                   100                                  105                                  110  
 Asn Glu Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Gln Arg Ile Thr  
                   115                                  120                                  125  
 Leu Tyr Leu Met Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
                   130                                  135                                  140  
 Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys  
                   145                                  150                                  155                                  160  
 Arg Leu Arg Arg Lys Asp  
                                   165

<210> 79  
 <211> 166

T02T50"2694560

&lt;212&gt; PRT

&lt;213&gt; human alpha interferon

&lt;400&gt; 79

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser His Phe Ser Cys Leu Lys Asp  
 20 25 30

Arg His Asp Phe Gly Phe Pro Glu Glu Glu Phe Asp Gly His Gln Phe  
 35 40 45

Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr  
 50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser  
 65 70 75 80

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu  
 85 90 95

Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met  
 100 105 110

Asn Val Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr  
 115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
 130 135 140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys  
 145 150 155 160

Arg Leu Arg Arg Lys Asp  
 165

&lt;210&gt; 80

&lt;211&gt; 166

&lt;212&gt; PRT

&lt;213&gt; human alpha interferon

&lt;400&gt; 80

Cys Asp Leu Pro Gln Thr His Ser Leu Gly His Arg Arg Thr Met Met  
 1 5 10 15

Leu Leu Ala Gln Met Arg Arg Ile Ser Leu Phe Ser Cys Leu Lys Asp  
 20 25 30

Arg His Asp Phe Arg Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
 35 40 45

Gln Lys Ala Glu Ala Ile Ser Val Leu His Glu Val Ile Gln Gln Thr  
 50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Val Ala Trp Asp Glu Arg  
 65 70 75 80

Leu Leu Asp Lys Leu Tyr Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu  
 85 90 95

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 1002160.2694560

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<210> 82
<211> 166
<212> PRT
<213> human alpha interferon
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&lt;400&gt; 82

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
 1 5 10 15

Leu Leu Ala Gln Met Arg Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp  
 20 25 30

Arg His Asp Phe Glu Phe Pro Gln Glu Glu Phe Asp Asp Lys Gln Phe  
 35 40 45

Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr  
 50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Leu Asp Glu Thr  
 65 70 75 80

Leu Leu Asp Glu Phe Tyr Ile Glu Leu Asp Gln Gln Leu Asn Asp Leu  
 85 90 95

Glu Ser Cys Val Met Gln Glu Val Gly Val Ile Glu Ser Pro Leu Met  
 100 105 110

Tyr Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr  
 115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Ser Cys Ala Trp Glu Val Val  
 130 135 140

Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Ile Asn Leu Gln Lys  
 145 150 155 160

Arg Leu Lys Ser Lys Glu  
 165

&lt;210&gt; 83

&lt;211&gt; 166

&lt;212&gt; PRT

&lt;213&gt; human alpha interferon

&lt;400&gt; 83

Cys Asp Leu Pro Glu Thr His Ser Leu Asp Asn Arg Arg Thr Leu Met  
 1 5 10 15

Leu Leu Ala Gln Met Ser Arg Ile Ser Pro Ser Ser Cys Leu Met Asp  
 20 25 30

Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
 35 40 45

Gln Lys Ala Pro Ala Ile Ser Val Leu His Glu Leu Ile Gln Gln Ile  
 50 55 60

Phe Asn Leu Phe Thr Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Asp  
 65 70 75 80

Leu Leu Asp Lys Phe Cys Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu  
 85 90 95

F022760 2694560



Glu Ala Cys Val Met Gln Glu Glu Arg Val Gly Glu Thr Pro Leu Met  
                   100                                  105                                  110  
 Asn Ala Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Arg Arg Ile Thr  
                   115                                  120                                  125  
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
                   130                                  135                                  140  
 Arg Ala Glu Ile Met Arg Ser Leu Ser Leu Ser Thr Asn Leu Gln Glu  
                   145                                  150                                  155                                  160  
 Arg Leu Arg Arg Lys Glu  
                                   165

<210> 84  
 <211> 166  
 <212> PRT  
 <213> human alpha interferon

<400> 84  
 Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
   1                                  5                                  10                                  15  
 Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp  
                   20                                  25                                  30  
 Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
                   35                                  40                                  45  
 Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr  
                   50                                  55                                  60  
 Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ile Trp Glu Gln Ser  
                   65                                  70                                  75                                  80  
 Leu Leu Glu Lys Phe Ser Thr Glu Leu Asn Gln Gln Leu Asn Asp Met  
                                   85                                  90                                  95  
 Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met  
                   100                                  105                                  110  
 Asn Val Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Gln Arg Ile Thr  
                   115                                  120                                  125  
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
                   130                                  135                                  140  
 Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Lys Ile Phe Gln Glu  
                   145                                  150                                  155                                  160  
 Arg Leu Arg Arg Lys Ser  
                                   165

<210> 85  
 <211> 166  
 <212> PRT  
 <213> human alpha interferon

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&lt;400&gt; 85

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp  
 20 25 30

Arg Pro Asp Phe Gly Leu Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe  
 35 40 45

Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr  
 50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser  
 65 70 75 80

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asn Leu  
 85 90 95

Glu Ala Cys Val Ile Gln Glu Val Gly Met Glu Glu Thr Pro Leu Met  
 100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr  
 115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
 130 135 140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys  
 145 150 155 160

Ile Leu Arg Arg Lys Asp  
 165

&lt;210&gt; 86

&lt;211&gt; 166

&lt;212&gt; PRT

&lt;213&gt; human alpha interferon

&lt;400&gt; 86

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile  
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser His Phe Ser Cys Leu Lys Asp  
 20 25 30

Arg Tyr Asp Phe Gly Phe Pro Gln Glu Val Phe Asp Gly Asn Gln Phe  
 35 40 45

Gln Lys Ala Gln Ala Ile Ser Ala Phe His Glu Met Ile Gln Gln Thr  
 50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Thr  
 65 70 75 80

Leu Leu Asp Lys Phe Tyr Ile Glu Leu Phe Gln Gln Leu Asn Asp Leu  
 85 90 95

Glu Ala Cys Val Thr Gln Glu Val Gly Val Glu Glu Ile Ala Leu Met  
 100 105 110

0954692.092304

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr  
 115 120 125

Leu Tyr Leu Met Gly Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val  
 130 135 140

Arg Ala Glu Ile Met Arg Ser Phe Ser Phe Ser Thr Asn Leu Gln Lys  
 145 150 155 160

Gly Leu Arg Arg Lys Asp  
 165

<210> 87  
 <211> 501  
 <212> DNA  
 <213> consensus alpha interferon

<400> 87  
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 atgggaagaa tctctccttt ctctgcctg aaggacagac atgactttgg atttccccag 120  
 gaggagtgtg atggcaacca gttccagaag gctcaagcca tctctgtcct ccatgagatg 180  
 atccagcaga ccttcaatct cttcagcaca aaggactcat ctgctgcttg ggatgagagc 240  
 ctccatagaaa aattttccac tgaactttac cagcaactga atgacctgga agcctgtgtg 300  
 atacaggagg ttgggggtgga agagactccc ctgatgaatg aggactccat cctggctgtg 360  
 aggaaatact tccaaagaat cactctttat ctgacagaga agaaatacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccctctctt tttcaacaaa cttgcaaaaa 480  
 agattaagga ggaaggattg a 501

<210> 88  
 <211> 501  
 <212> DNA  
 <213> human alpha interferon

<400> 88  
 tgtgatctgc ctcagaccca cagcctgggt aataggaggg ccttgatact cctggcacaa 60  
 atgggaagaa tctctccttt ctctgcctg aaggacagac atgactttgg acttccccag 120  
 gaggagtgtg atggcaacca gttccagaag actcaagcca tccctgtcct ccatgagatg 180  
 atccagcaga ccttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240  
 ctccatagaaa aattttccac tgaactttac cagcaactga ataacctgga agcatgtgtg 300  
 atagaggagg ttgggatgga agagactccc ctgatgaatg aggactccat cctggctgtg 360  
 aggaaatact tccaaagaat cactctttat ctaacagaga agaaatacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccctctctt tttcaacaaa cttgcaaaaa 480  
 agattaagga ggaaggattg a 501

<210> 89  
 <211> 501  
 <212> DNA  
 <213> human alpha interferon

<400> 89  
 tgtgatctgc ctcagaccca cagcctgggt aataggaggg ccttgatact cctggcacaa 60  
 atgggaagaa tctctccttt ctctgcctg aaggacagac ctgactttgg acttccccag 120  
 gaggagtgtg atggcaacca gttccagaag actcaagcca tctctgtcct ccatgagatg 180  
 atccagcaga ccttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240  
 ctccatagaaa aattttccac tgaactttac cagcaactga ataacctgga agcatgtgtg 300  
 atacaggagg ttgggatgga agagactccc ctgatgaatg aggactccat cctggctgtg 360  
 aggaaatact tccaaagaat cactctttat ctaacagaga agaaatacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tctctctctt tttcaacaaa cttgcaaaaa 480  
 atattaagga ggaaggattg a 501

FOOTNOTES: 26945680

<210> 90  
 <211> 501  
 <212> DNA  
 <213> human alpha interferon

<400> 90  
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 atgaggagaa tctctccttt ctctgcttg aaggacagac atgactttga atttccccag 120  
 gaggaatttg atggcaacca gttccagaaa gctcaagcca tctctgtcct ccatgagatg 180  
 atgcagcaga ccttcaatct cttcagcaca aagaactcat ctgctgcttg ggaatgagacc 240  
 ctctagaaa aattctacat tgaacttttc cagcaaatga atgacctgga agcctgtgtg 300  
 atacaggagg ttgggggtgga agagactccc ctgatgaatg aggactccat cctggctgtg 360  
 aagaaatact tccaaagaat cactctttat ctgatggaga agaaatacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccctctctt tttcaacaaa cttgcaaaaa 480  
 agattaagga ggaaggattg a 501

<210> 91  
 <211> 501  
 <212> DNA  
 <213> human alpha interferon

<400> 91  
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 atgggaagaa tctctccttt ctcatgctg aaggacagac atgatttcgg atttccccag 120  
 gaggagtttg atggccacca gttccagaag actcaagcca tctctgtcct ccatgagatg 180  
 atccagcaga ccttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240  
 ctctagaaa aattttccac tgaactttac cagcaactga atgacctgga agcatgtgtg 300  
 atacaggagg ttgggggtgga agagactccc ctgatgaatg tggactccat cctggctgtg 360  
 aggaaatact tccaaagaat cactctttat ctaacagaga agaaatacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccctctctt tttcaacaaa cttgcaaaaa 480  
 agattaagga ggaaggattg a 501

<210> 92  
 <211> 501  
 <212> DNA  
 <213> human alpha interferon

<400> 92  
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 atgaggagaa tctctccttt ctctgtctg aaggacagac atgacttcag atttccccag 120  
 gaggagtttg atggcaacca gttccagaag gctgaagcca tctctgtcct ccatgaggtg 180  
 attcagcaga ccttcaatct cttcagcaca aaggactcat ctgttgcttg ggaatgagag 240  
 cttctagaca aactctatac tgaactttac cagcagctga atgacctgga agcctgtgtg 300  
 atgcaggagg tgtgggtggg agggactccc ctgatgaatg aggactccat cctggctgtg 360  
 agaaaatact tccaaagaat cactctctac ctgacagaga aaaagtacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccctctctt catcaagaaa cttgcaagaa 480  
 aggttaagga ggaaggaata a 501

<210> 93  
 <211> 501  
 <212> DNA  
 <213> human alpha interferon

<400> 93  
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 atgggaagaa tctctccttt ctctgcttg aaggacagac atgaattcag atttccccag 120  
 gaggagtttg atggccacca gttccagaag actcaagcca tctctgtcct ccatgagatg 180  
 atccagcaga ccttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240  
 ctctagaaa aattttccac tgaactttac cagcaactga atgacctgga agcatgtgtg 300  
 atacaggagg ttgggggtgga agagactccc ctgatgaatg aggactccat cctggctgtg 360

09549094560

aggaaataact tccaaagaat cactctttat ctaatggaga agaaatacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccttctctt tttcaacaaa cttgaaaaaa 480  
 ggattaagga ggaaggattg a 501

<210> 94

<211> 501

<212> DNA

<213> human alpha interferon

<400> 94

tgtgatctgc ctcagactca cagcctgggt aacaggaggg ccttgatact cctggcacaa 60  
 atgcaagaa tctctccttt ctctgcctg aaggacagac atgactttga attccccag 120  
 gaggagtttg atgataaaca gtccagaag gctcaagcca tctctgtcct ccattgagatg 180  
 atccagcaga ctttcaacct cttcagcaca aaggactcat ctgctgcttt ggatgagacc 240  
 cttctagatg aattctacat cgaacttgac cagcagctga atgacctgga gtctgtgtg 300  
 atgcaggaag tgggggtgat agagtctccc ctgatgaatg aggacttcat cctggctgtg 360  
 agaaataact tccaaagaat cactctatat ctgacagaga agaaatacag ctcttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccttctctt tatcaatcaa cttgcaaaaa 480  
 agattgaaga gtaaggatg a 501

<210> 95

<211> 501

<212> DNA

<213> human alpha interferon

<400> 95

tgtgatctcc ctgagaccca cagcctggat aacaggagga ccttgatgct cctggcacaa 60  
 atgagcagaa tctctccttc ctctgtctg atggacagac atgactttgg attccccag 120  
 gaggagtttg atggcaacca gtccagaag gctccagcca tctctgtcct ccattgagctg 180  
 atccagcaga tcttcaacct cttctccaca aaagattcat ctgctgcttg ggatgaggac 240  
 ctctagaca aattctgcac cgaactctac cagcagctga atgacttggga agcctgtgtg 300  
 atgcaggagg agagggtggg agaaactccc ctgatgtacg cggactccat cctggctgtg 360  
 aagaaataact tccaaagaat cactctatat ctgacagaga agaaatacag cccttgtgcc 420  
 tgggaggttg tcagagcaga aatcatgaga tccttctctt tatcaacaaa cttgcaagaa 480  
 agattaagga ggaaggaata a 501

<210> 96

<211> 501

<212> DNA

<213> human alpha interferon

<400> 96

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 atgggaagaa tctctccttt ctctgcctg aaggacagac atgactttgg attccccaa 120  
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